

HAIL.

Hail was reported as follows: 3d, Ala., Cal., Fla., Ga., Miss., Tenn. 4th, Ariz., Kans. 5th, Ariz. 6th, Wash. 7th, Kans. 10th, N. J. 12th, Tex., Wash. 13th, Tex. 14th, Wash. 17th, N. C. 19th, Cal., Wash. 20th, Ariz. 26th, N. J., N. C. 29th, Nev., Wash. 30th, Ariz., Cal., Nev. 31st, Kans.

SLEET.

Description of the more severe sleet storms of the month is given under "Local storms." Sleet was reported as follows: 2d, Mich., Va. 3d, Conn., Ind., Me., N. H., N. J., N. Y., Ohio, Pa. 4th, Me., N. H. 5th, Me., N. H., N. J., Utah, Wis. 6th, Me., Mass., Pa., Tex. 7th, Ark., Ill., Ind., Ky., Tenn., Va. 8th, Ky., N. C., Va. 9th, N. C., Ohio. 11th, Mich. 12th, N. Y., Tex. 14th, Wash. 15th, Iowa, Mich., W. Va. 16th, Ind., N. C., Ohio, S. C., Tenn., Va., Wis. 17th, Conn., Me., Mich., N. Y., Pa., Vt., Va. 18th, Me., Mich., Pa., Vt. 19th, Mich. 20th, Mich. 21st, N. Y., Pa. 22d, Mich., Mont., N. C., Pa. 23d, N. J., N. Y. 24th, Ill., Kans., Ky., Mo., Tenn. 25th, Ind., Ky., Mo., N. J., N. C., Ohio, S. C., Va., W. Va. 26th, Conn., D. C., Iowa, Ky., Mass., N. H., N. J., N. Y., N. C., N. Dak., Pa., Tenn., Va., Wis. 27th, Me., Mass., N. H., N. Y., Pa. 30th, Mich. 31st, Colo., Iowa, Kans., La., Md., Minn., Mo., N. Mex., N. Y., Pa.

MAXIMUM RAINFALL IN ONE HOUR OR LESS.

The following table is a record of the heaviest rainfall during December, 1890, for periods of five and ten minutes and

one hour, as reported by regular stations of the Signal Service furnished with self-registering gauges:

Station.	Maximum fall in—					
	5 min.	Date.	10 min.	Date.	1 hour.	Date.
	Inch.		Inch.		Inch.	
Bismarck, N. Dak.	0.05	26	0.12	26	0.40	26
Boston, Mass.	0.05					
Buffalo, N. Y.						
Cincinnati, Ohio						
Chicago, Ill.	0.02	31	0.03	31	0.10	31
Cleveland, Ohio						
Denver, Colo.						
Detroit, Mich.						
Dodge City, Kans.					0.05	31
Duluth, Minn.						
Eastport, Me.	0.20	24	0.35	24	1.30	24
Galveston, Tex.	0.15	14	0.20	14	0.40	14
Jupiter, Fla.	0.04	4	0.07	4	0.22	4
Key West, Fla.						
Marquette, Mich.						
Memphis, Tenn.						
New York City	0.03	17	0.05	17	0.24	17
New Orleans, La.	0.30	5	0.50	5	1.25	25
Norfolk, Va.						
Philadelphia, Pa.						
Philadelphia Water Works	0.02	17	0.04	17	0.21	17
Portland, Oregon	0.05	23	0.06	23	0.20	23
Saint Louis, Mo.						
Saint Paul, Minn.						
San Diego, Cal.	0.05	4	0.10	4	0.30	4
San Francisco, Cal.	0.15	3	0.30	3	0.45	3
Savannah, Ga.	0.25	8	0.50	8	1.20	8
Washington City	0.10	17	0.10	17	0.20	17
Wilmington, N. C.					0.05	16

* Not sufficient to register. † Rain-gauge not working. ‡ Less than .05 in 1 hour. § No record on account of snow.

WINDS.

The prevailing winds during December, 1890, are shown on chart II by arrows flying with the wind. In New England and the middle Atlantic states the winds were generally from the northwest; in the south Atlantic states, from southwest to west, except on the North Carolina coast, where they were from the northeast; over the Florida Peninsula, from west to northwest; in the east Gulf states and on the middle Pacific coast, from northwest to north, except on the coast of north California, where they were from the southeast; in the lower Rio Grande valley and on the north Pacific coast, from east to south; in the Ohio Valley and Tennessee, the extreme northwest, on the southeast slope of the Rocky Mountains, and over the middle plateau region, from south to northwest, except at Winnemucca, Nev., where the prevailing direction was from the east; in the lower lake region, the upper Mississippi and Missouri valleys, and on the northeast slope of the Rocky Mountains, from southwest to northwest; on the middle-eastern slope of the Rocky Mountains, and over the southern plateau region, from southwest to north; over the northern plateau region, from southeast to southwest; on the south Pacific coast, from west to north; and in the west Gulf states and the upper lake region, variable.

HIGH WINDS (in miles per hour).

Wind velocities of 50 miles, or more, per hour were reported at regular stations of the Signal Service, as follows: 1st, 62, sw., at Fort Canby, Wash. 2d, 70, e., at Fort Canby, Wash. 3d, 66, e., at Fort Canby, Wash. 4th, 52, se., at Eastport, Me.; 58, w., at Wood's Holl, Mass.; 55, nw., at Block Island, R. I. 9th, 55, sw., at Fort Assinniboine, Mont. 11th, 54, e., at Fort Canby, Wash. 12th, 82, se., at Fort Canby, Wash. 13th, 54, sw., at Chicago, Ill. 14th, 64, se., at Fort Canby, Wash.; 50, nw., at Wood's Holl, Mass. 15th, 72, s., at Fort Canby, Wash. 16th, 60, sw., at Fort Assinniboine, Mont.; 70, s., at Fort Canby, Wash. 17th, 50, sw., at Fort Assinniboine, Mont.; 60, se., at Fort Canby, Wash.; 54, ne., at Boston, Mass.; 82, ne., at Block Island, R. I.; 52, ne., at New Haven, Conn.; 64, ne., at Harrisburg, Pa. 18th, 50, nw., at Block Island, R. I.; 60, s., at Fort Canby, Wash. 19th, 56, sw., at Fort Canby.

Wash.; 60, nw., at Wood's Holl, Mass. 20th, 76, s., at Fort Canby, Wash. 21st, 72, sw., at Fort Assinniboine, Mont.; 64, s., at Fort Canby, Wash. 23d, 50, nw., at Chicago, Ill.; 54, sw., at Buffalo, N. Y.; 51, sw., at Detroit, Mich.; 51, w., at Grand Haven, Mich.; 50, nw., at Sault de Ste. Marie, Mich. 25th, 50, sw., at Fort Assinniboine, Mont.; 60, w., at Helena, Mont.; 84, sw., at Fort Canby, Wash. 26th, 69, e., at Block Island, R. I.; 58, nw., at Bismarck, N. Dak.; 60, nw., at Fort Buford, N. Dak.; 52, nw., at Valentine, Nebr.; 54, nw., at Yankton, S. Dak.; 54, nw., at Fort Sully, S. Dak. 27th, 54, se., at Eastport, Me. 28th, 52, nw., at Wood's Holl, Mass. 31st, 60, w., at Abilene, Tex.

LOCAL STORMS.

On the 1st a violent wind and rain storm prevailed over Nova Scotia, Cape Breton Island, and Newfoundland. At Halifax the rain changed to snow, which drifted heavily. Great damage was caused to shipping along the coasts of the Canadian Maritime Provinces by heavy wind and high seas. On the morning of the 3d a violent thunder-storm moved eastward over Pensacola, Fla., with hail about the size of peas, and wind reaching a velocity of 44 miles per hour. A heavy w. to n. gale swept over southeast Massachusetts on the 4th. At Wood's Holl, Mass., a heavy gale, reaching 58 miles per hour, and snow, changing into rain, prevailed. Two schooners went ashore near that place and were abandoned by their crews. On the 5th a heavy rain and thunder-storm passed over Farmerville, Union Co., La., and a violent wind storm, causing damage to out-buildings, was reported at Love's Lake, Red River Co., La. On the 8th, at 9 p. m., central time, a storm moved ne. over Jersey, Walton Co., Ga., damaging buildings to the extent of about \$500, and killing one person. The path of greatest destruction was about two miles in length and about 50 yards in width. Articles were carried upward and to the north, and the storm had a whirling motion from right to left. On the 12th a high wind, reaching 45 miles per hour, prevailed in New York City. In Brooklyn a building in course of erection was blown down and one person killed. On the 13th a heavy sw. gale prevailed at Grand Haven, Mich., with a maximum velocity of 48 miles per hour.

A heavy sea was running on the lake, and no vessels arrived or departed. On the 17th heavy gales prevailed in the Atlantic coast states from North Carolina to Maine. A report from Southport, N. C., states that a schooner went ashore on Piney Point Beach, about 3 miles sw. of that place. At Washington City heavy rain and high wind from the ne. caused considerable damage; maximum wind velocity 48 miles, with an extreme velocity of 50 miles per hour. At Baltimore, Md., the wind reached a velocity of 39 miles per hour from the ne., this being the highest velocity recorded there in December, with one exception; a great amount of damage was reported; vessels in the harbor dragged their anchors, and several small craft were sunk; many roofs were blown off; steamers were delayed; and much damage was caused throughout the state and along the neighboring coasts. At Philadelphia, Pa., the wind reached a velocity of 48 miles per hour, and damage was caused to plate glass store windows, telegraph wires, etc. A ne. gale prevailed at Harrisburg, Pa.; several old houses were unroofed, and poles were blown down. At Woodbury, N. J., a heavy ne. gale, with rain, prevailed. At Atlantic City, N. J., rain and high ne. winds began in the early morning. The tide was unusually high and the meadows were submerged. The electric street car sheds were blown down, and the damage to buildings and cars was estimated at \$10,000. Several other buildings were damaged. At New Brunswick, N. J., a heavy ne. storm of wind and rain set in in the early morning and continued all day, causing high water in the Raritan River, and doing damage to trees, etc. At New York City a severe ne. storm prevailed, the maximum wind velocity, 48 miles, being reached at 4.25 p. m. Traffic on the rivers and bays was practically suspended. Many wrecks were reported along the coast. Much damage was caused along the New Jersey coast by high seas. In the vicinity of New York City 17 schooners were dismasted and 4 steamers driven ashore. At New Haven, Conn., a heavy ne. gale prevailed, with heavy rain, in the afternoon and evening. Much damage was done to electric lights; cellars were flooded, and steamers were delayed. At Block Island, R. I., a violent ne. storm, with a maximum wind velocity of 82 miles per hour at 6.23 p. m., and an extreme velocity of 96 miles per hour, prevailed. Buildings, etc., were damaged to the extent of about \$1,000.

On the 23d a heavy wind storm prevailed over the Lake region. At Barborton, 5 miles south of Akron, Ohio, a building was demolished, killing one person and injuring several. At Sault de Ste. Marie, Mich., the storm was the severest of the season, high wind and snow continuing all day; maximum wind velocity 50 miles per hour from the nw. The roof of a hotel was damaged to the extent of about \$500. At Milwaukee, Wis., the wind attained a velocity of 42 miles per hour from the nw., and all vessels remained in port. At Detroit, Mich., the wind reached a velocity of 51 miles from the sw.; a market building was blown down, and 3 persons seriously injured. At Buffalo, N. Y., the wind reached a velocity of 54 miles per hour, and the lake was very rough. On the 25th a severe storm of wind and rain prevailed over Washing-

ton, Oregon, and west Montana. At Seattle, Wash., a gale from the sw., with rain, began 5 a. m. and ended 9 a. m., the estimated wind velocity being 60 miles per hour. Shipping was damaged to the extent of about \$20,000, and on the railroads the damage amounted to about \$30,000. At Olympia, Wash., a wind storm, with rain, began 7.15 a. m. and ended 9.25 a. m., with maximum velocity 30 miles per hour from the sw. In the city a large barn was blown down, damage \$2,000, and about 12 miles from Olympia 2 men and a horse were killed by a falling tree. Some damage was done on Puget Sound about Tacoma and Seattle. At Portland, Oregon, the wind reached a velocity of 35 miles per hour. At Astoria, Oregon, a violent sw. gale, with rain, began 3 a. m. and ended in the early morning, causing slight damage to shipping and buildings. At Helena, Mont., a heavy w. gale, with maximum velocity 60 miles per hour, prevailed from 4 p. m. to 11.50 p. m., during which out-buildings, roofs, etc., were damaged to the extent of about \$5,000. On the 26th high wind, with heavy snow, prevailed in the middle Atlantic coast states, and New England. At Vineyard Haven, Mass., a fierce e. gale, with heavy snow and rain, began at 6 a. m., during which a schooner and a brig at that port were damaged. At Block Island, R. I., a violent storm from the e., with heavy snow, began 4.20 a. m.; attained a velocity of 69 miles per hour at 6.34 p. m.; an extreme velocity of 108 miles per hour at 6.42 p. m., and ended 9.05 p. m. No damage was reported at that place. At Narragansett Pier, R. I., a high ne. gale began during the early morning, and heavy snow at 8 a. m. A three-masted schooner went ashore one-fourth mile north of the station. The crew were taken off by the life-saving crew. The vessel and cargo, valued at \$20,000, were a total loss. A schooner went ashore 2 miles south of the station. The vessel went to pieces in less than 20 minutes, and before the life-saving crew could reach them the captain, steward, and one sailor were lost. The vessel and cargo, valued at \$20,000, were a total loss. At New Haven, Conn., a heavy ne. gale, with snow and sleet, began 5.50 a. m., and ended before midnight. Traffic on street and railroad cars was interrupted, and the New York boats did not run. At New York City light and heavy snow continued during the day. The wind reached 38 miles per hour from the ne. at 5.05 p. m., and backed to n. at 9.10 p. m. The storm was very severe along the coast, and navigation about New York City was practically suspended. No vessels left the port of New York, and 3 wrecks were reported on the New Jersey and Long Island coasts. At New Brunswick, N. J., a severe ne. gale, with heavy snow, prevailed. The snow drifted heavily, causing delay to trains. At Creighton, Nebr., a severe nw. gale caused damage to chimneys, etc. At Sioux City, Iowa, the wind reached a velocity of 36 miles per hour from the s. at 4.05 a. m., and a velocity of 40 miles per hour from the nw. at 4.10 p. m. On the 31st a thunder-storm, doing considerable damage, was reported at Dadeville, Mo. At Abilene, Tex., high s. to w. winds, reaching a velocity of 60 miles per hour from the w., caused much damage to roofs, signs, etc. At Childress, Tex., a heavy gale damaged buildings to the extent of about \$200.

INLAND NAVIGATION.

ICE IN RIVERS AND HARBORS—CLOSING OF NAVIGATION.

Lake Ontario.—A steamer left Oswego, N. Y., on the 13th; this was the last departure of the season.

Lake Erie.—At Buffalo, N. Y., navigation closed on the 8th; no ice visible on the lake or river on that date. 28th, ice on the lake to the outer breakwater, the first ice of the season. At Erie, Pa., the first ice of the season formed on the bay during the night of the 8-9th. At Cleveland, Ohio, the river custom-house closed on the 9th, indicating the closing of navigation for the season. At Sandusky, Ohio, navigation closed on the 6th.

Lake Huron.—Navigation closed at Port Huron, Mich., on the 25th. At Alpena, Mich., floating ice was reported in Thunder Bay River from the 1st to 4th. On the 8th the bay and river were frozen over and navigation fully suspended.

Lake Michigan.—On the 25th considerable floating ice, extending one-half mile out, was reported along the shore of the lake at Chicago, Ill. At Milwaukee, Wis., navigation closed on the 5th.

Green Bay.—Navigation closed at Green Bay, Wis., on the 4th, the lights at Grassy Island and Long Tail Point being discontinued for the season.